is nothing of interest to the student of herpetology in the first two chapters, on the classification, evolution, history, distribution, general habits and identification of species of snakes, and the chapter on snake charmers, Kafir superstitions, etc., and the one on human physiology may also be ignored.

On the other hand, the herpetologist will find much of interest in the accounts of the habits of different species. The writer is evidently a careful field observer, and his descriptions of the feeding and breeding habits of certain forms are a distinct contribution. For example, the description of the feeding habits of the puff adder (p. 225) could hardly be improved. A very notable feature also is the numerous photographs of snakes, both in their natural haunts and in captivity. The series showing a specimen of *Dasypeltis scabra* eating an egg and ejecting the shell, and the photographs of the mole snake, ringhals cobra, and puff adder with newly born young are notable, and there are many others of equal interest. There is also a considerable amount of information on the habitat preferences of various forms that will be useful.

The author is to be commended for the care exercised in guarding against the errors that are so liable to occur in a popular account. The word skin is rather loosely used for the stratum corneum in the account of sloughing (p. 16); snakes do frequently eat dead animals in nature (p. 40); it is doubtful if many naturalists still hold the opinion that the fangs of opisthoglyphs are primarily for holding the prey (p. 139); and the toad is not a reptile (p. 227). It is rather surprising that the writer advocates sucking the wound made by the bite of a venomous snake, since this is dangerous unless one is sure that there are no abrasions about the mouth, and Noguchi asserts that the procedure is quite useless. It may be added that the author's style is rather tautological, there is some irrelevant matter, and a closer grouping of the subject matter would be advantageous.

The reviewer would suggest that an easy key to the South African species would much increase the value of the book. It is doubtful if many persons would take the trouble to dissect out the jaws to identify the species; at any rate it would not be easy to use the author's key, scattered as it is over several chapters.

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General Physics. By W. WATSON, F.R.S. Longmans, Green & Co. 564 pages, with 311 figures and diagrams.

It is a very interesting fact that Professor Watson, who has given to us the comprehensive "Text-book of Physics" with its nine hundred and fifty pages, should find it necessary to arrange another text to meet the needs of "engineering, medical and other students." Not only has he condensed and rearranged his larger work, he has placed the emphasis on different topics and has omitted many. Among these may be noted the discussion of the energetics of a voltaic cell and that of Maxwell's electromagnetic theory. Fifty pages in the older text are given to electrolysis and electric cells where only sixteen are required in the new text. The three hundred pages given to electricity and magnetism in the older text have here been cut in half, notwithstanding the fact that much new matter is added on account of the discussion of radioactivity and wireless telegraphy.

It is rather probable that the newer text will suit the needs of a larger number of instructors in general physics in American colleges than did the older text. For it can be said that the table of contents includes all the main essential principles of physics with a reasonable number of applications to the affairs of every-day life. The presentation is direct, matter of fact, concise, clear. There is no time or space for the spectacular or ornate. The author, being an Englishman, does not give an explanation, right or wrong, of the curving of a base ball, nor of a tennis ball—though had he done so he might have claimed that he was but following the example set by the illustrious Newton. Nor is the mono-rail car discussed. But in America

these omissions are not as serious as they are in England, for here one can probably find them discussed in the Sunday editions of the daily papers!

There are some omissions, however. In the chapter on radiation no mention is made of the sensitive instruments for detecting and measuring radiant energy—the thermoelement, the radiometer, the bolometer. In fact, the discussion of radiation is rather inadequate. In the chapter on the interference of light several pages are given to the discussion of Fresnel's mirrors and biprism, but no mention is made of the interferometer, although the latter is as important theoretically as the former and vastly more important in its numerous applications to exact measurement.

In the chapters devoted to heat, however, admirable illustrations of the application of the principles to modern heat engines are given. In electricity, too, the points of contact of the subject with the world of to-day are shown.

In a book where so much material is presented in so few pages the method of approach is abrupt and the style at times uninteresting. The text will not find favor with those teachers who place emphasis on the inductive aspect of the science nor will it be pleasing to those students who look for entertainment in their reading, but it is a very dependable, clear and fairly complete statement of the principles of physics.

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Essentials of Physics for College Students. A Text-book for Undergraduates and a Lecture Course and Reference Work for Teachers and Other Students of Physics. By Daniel W. Hering. The D. Van Nostrand Co. 353 pages, with 166 illustrations.

The author tells us in the preface that the work is the outgrowth of a course of lectures which he has delivered for several years past to undergraduate students, and that it is intended for that class of students preparing to fill the position of educated men and women who are not specialists in science. As the contents of the book are intended to be presented in "sixty lectures of fifty minutes each" some rather important, perhaps essential, parts of the subject have received a very brief description. On the other hand, liberal space is given to some pseudo-philosophic topics. One notes that the author gives only two pages to the presentation and discussion of the mechanical equivalent of heat and the laws of thermodynamics. The connection between the absorbing and reflecting power of surfaces is given in two lines. But notwithstanding this brevity the author devotes the larger part of the first twelve pages to these captions or questions: Physics, is it or is it not a study of matter, ether and motion? Why study physics? Space, time, matter; Energy "a capability of matter." The best feature in this discussion is found in the definitions and statements quoted from Maxwell's "Matter and Motion."

A couple of pages are given to the discussion of *inertia* in which the author decides that one can no more measure the quantity of matter by its inertia than one can measure the size of a dead elephant by its deadness. This adherence to the notion that *inertia* is a property of matter which can not be represented quantitatively is not in accord with the custom of physicists. The terms *inertia* and *moment of inertia* are used quantitatively in physics. Such authors as Crew and Ames set forth in a very clear manner the mode of measuring the quantity of a bit of matter by its inertia or reluctance to change of linear motion. The author does not deal with the large topic of rotational motion, consequently he makes no reference to *moment of inertia*.

In dealing with the units involved in force and work the author brings in the engineer's system (footnote, p. 32): "If force be measured in pounds then the mass will be in pounds $\div 32$ and work will be in foot-pounds." Had the equation of force been written $F = kma$ instead of $F = ma$ there would have been no necessity for this statement and the confusion it brings to students would have been avoided.

Apart from these criticisms the text is to